

# 1 PETITION

2 Mail Stop Patent Application  
3 Commissioner for Patents  
4 P.O. Box 1450  
5 Alexandria, VA 22313-1450

6 Your Petitioner, John Williams, a citizen of the United States  
7 of America and resident of the State of New York, whose residence  
8 and mailing address is 120 Greenridge Avenue, White Plains, New  
9 York 10605, prays that Letters Patent Protection be granted to him  
for a

## 10 **EMERGENCY BACKUP COMMUNICATIONS SYSTEM**

11 as set forth in the following specification:

### 12 **Cross-Reference to Related Provisional Patent**

13 This application claims priority based on a provisional  
14 patent, specifically on the Provisional Patent Application Serial  
15 No. 60/426,758 filed November 15, 2002.

### 16 **Background of the Invention**

#### 17 **1. Technical Field**

18 The present invention is related to emergency communication  
19 systems and, more particularly, to a regional emergency backup  
20 communications system which includes redundant communication  
21 systems connecting a plurality of public safety answering points  
22 (PSAP) to at least one centralized operations command center which  
23 is designed to withstand both natural and man-made disasters to  
24 maintain generally continuous emergency communications regardless  
25 of the disaster scenario.

26

27

28

1   **2. Description of the Prior Art**

2       At the present time, the approach to emergency communication  
3   across the country is a cobbled-together web of already-available  
4   communications networks which offer highly-variable levels of  
5   service in an actual emergency. Further, these networks are  
6   generally standalone installations that are not interconnected, are  
7   not subject to nationally-consistent standard operating procedures  
8   and are not required to utilize consistent or compatible  
9   technologies. For example, in large cities where the emergency  
10   communications network is used frequently, the emergency  
11   communications network is modernized and very reliable. On the  
12   other hand, in rural areas and smaller towns, the emergency  
13   communications network is not as critical to the functionality of  
14   the town and therefore may be outdated and unreliable. Given the  
15   fact that disasters occur in all areas of the country, this  
16   haphazard communication web has the potential to exacerbate any  
17   disaster situation as opposed to offering a solution or remedy  
18   therefor. In fact, the telephone communication systems currently  
19   in place can be woefully inadequate during emergencies and  
20   disasters for providing communication between citizens and  
21   emergency personnel, as these telephone systems are prone to  
22   overload and failure due to line integrity disruptions. It has  
23   been found that the telephone communication system is very often  
24   one of the first infrastructure systems to be rendered inoperable  
25   during a disaster. When such an interruption occurs, it suddenly  
26   becomes virtually impossible to receive emergency help calls at the  
27   primary PSAP which serves to coordinate the emergency response in  
28

1 the regional area. There is therefore a need for a communication  
2 system and backup PSAP which will permit management of the  
3 emergency situation regardless of the status of the primary PSAP.

4 The situation that often occurs in connection with emergency  
5 scenarios is that the primary PSAP is overloaded with calls from  
6 citizens regarding the disaster. With the organization of the  
7 phone system comprising a local telephone carrier exchange central  
8 office with numerous branches extending outwards therefrom, it is  
9 most likely that communication between individuals and the local  
10 telephone carrier exchange central office will continue during a  
11 disaster while the connection between the local telephone carrier  
12 exchange central office and the PSAP becomes overloaded, thus  
13 preventing calls from being received at the PSAP. When the phone  
14 system overloads, communication between the PSAP and the local  
15 telephone carrier exchange central office is disrupted and it has  
16 been found that the majority of 911 facilities in the country do  
17 not have adequate backup communication systems to overcome such a  
18 disruption. In fact, it is not commercially feasible in all but  
19 the largest metropolitan areas to include such a backup system and  
20 therefore in the majority of situations, when the connection  
21 between the local telephone carrier exchange central office and the  
22 PSAP fails, no further communications with the citizenry is  
23 possible. There is therefore a need for an emergency  
24 communications backup system which will permit continued  
25 communication with the citizenry during times of emergency.

26 Therefore, an object of the present invention is to provide an  
27 improved emergency communications backup system.

28

1       Another object of the present invention is to provide an  
2 emergency communications backup system which includes a generally  
3 independent and secure communications system which functions  
4 independent of the standard communications web to ensure  
5 communications operation post-disaster.

6       Another object of the present invention is to provide an  
7 emergency communications backup system which can respond to  
8 regional disasters in a coordinating manner over and above the  
9 responses of the individual PSAPs.

10      Another object of the present invention is to provide an  
11 emergency communications backup system which can be used to  
12 supplement the existing emergency response communications web  
13 thereby providing needed backup for the system which is not  
14 available at present.

15      Another object of the present invention is to provide an  
16 emergency communications backup system which will respond to local  
17 emergency requests in the same manner as would be performed by the  
18 local PSAP to keep the in-place emergency response system as intact  
19 as possible during times of extreme duress.

20      Finally, an object of the present invention is to provide an  
21 emergency communications backup system which is efficient, safe and  
22 durable in use.

23

24

25

26

27

28

1 **Summary of the Invention**

2       The present invention provides, in combination, at least one  
3 public safety answering point operative to receive emergency  
4 communications from at least one local exchange carrier facility  
5 and dispatch emergency response units in response to receipt of the  
6 emergency communications and an emergency backup communications  
7 system for facilitating emergency responses in the event of loss of  
8 communication and/or inoperability of the at least one local public  
9 safety answering point. The emergency backup communications system  
10 includes a secondary central communications facility in generally  
11 independent and generally secure information transmission  
12 connection with the local exchange carrier facility. The system  
13 further includes an automated location identification interface  
14 system operative to receive and facilitate information reception  
15 from an automated location identification (ALI) system associated  
16 with the local exchange carrier facility and a computer aided  
17 dispatch interface system operative to receive and facilitate  
18 information reception from a computer aided dispatch (CAD) system  
19 associated with the local exchange carrier facility. At least one  
20 operator is housed within the secondary central communications  
21 facility, the operator being trained to receive incoming emergency  
22 communications and screen the incoming emergency communications for  
23 location and response information. Finally, a dispatch system  
24 housed within the secondary central communications facility is  
25 operative to interpret the information received via the automated  
26 location identification interface system and the computer aided  
27 dispatch interface system and transmit dispatch information

28

1 including location and situation information to emergency response  
2 units for response to incoming emergency communications from the  
3 local exchange carrier facility.

4 The emergency backup communications system as thus described  
5 clearly offers several advantages over those systems found in the  
6 prior art. For example, particularly in light of the 9/11 tragedy  
7 and the potential for terrorist attacks at any time and at any  
8 place, there is no guarantee that the present 911 system will be  
9 able to deal with the aftermath of such an attack, and at the  
10 present time there is no backup communication system dedicated to  
11 emergency response. Furthermore, because the communications system  
12 of the present invention is generally independent and secure as  
13 compared to the standard communication network used by the PSAP,  
14 the chances are far greater that the communications network of the  
15 present invention will survive a catastrophe intact enabling  
16 continuous communication between members of the afflicted public  
17 and the rescue and emergency workers who are trying to assist them.  
18 Also, the emergency backup communications system of the present  
19 invention is designed for use with both military and civil  
20 communications systems on all levels, including local, state and  
21 federal governmental entities which means that the present  
22 invention is a macrosystem in that it is designed to coordinate  
23 emergency response not only locally, but regionally and nationally  
24 if necessary. The present invention thus provides a substantial  
25 improvement over those systems found in the prior art.

26  
27  
28

1   **Brief Description of the Drawings**

2       Figure 1 is a flow diagram showing the general system  
3 description of the emergency backup communications system of the  
4 present invention;

5       Figure 2 is a flow diagram showing the normal operation of a  
6 911 emergency response system during a typical emergency;

7       Figure 3 is a flow diagram illustrating the operation of the  
8 emergency backup communications system of the present invention  
9 when the primary 911 system is inoperable; and

10      Figure 4 is an illustration of the potential services of the  
11 emergency backup communications system of the present invention.

1 **Description of the Preferred Embodiment**

2       The emergency backup communications system of the present  
3 invention is shown best in Figures 1 and 3 as providing a "safety  
4 net" for 911 systems currently in operation. At the present time,  
5 the approach to emergency communication across the country is a  
6 cobbled-together web of already-available communications networks  
7 which offer highly-variable levels of service in an actual  
8 emergency. Further, these networks are generally standalone  
9 installations that are not interconnected, are not subject to  
10 nationally-consistent standard operating procedures and are not  
11 required to utilize consistent or compatible technologies. For  
12 example, in large cities where the emergency communications network  
13 is used frequently, the emergency communications network is  
14 modernized and very reliable. On the other hand, in rural areas  
15 and smaller towns, the emergency communications network is not as  
16 critical to the functionality of the town and therefore may be  
17 outdated and unreliable. Given the fact that disasters occur in  
18 all areas of the country, this haphazard communication web has the  
19 potential to exacerbate any disaster situation as opposed to  
20 offering a solution or remedy therefor. In fact, the telephone  
21 communication systems currently in place can be woefully inadequate  
22 during emergencies and disasters for providing communication  
23 between citizens and emergency personnel, as these telephone  
24 systems are prone to overload and failure due to line integrity  
25 disruptions. It has been found that the telephone communication  
26 system is very often one of the first infrastructure systems to be  
27 rendered inoperable during a disaster. When such an interruption  
28

1 occurs, it suddenly becomes virtually impossible to receive  
2 emergency help calls at the primary PSAP which serves to coordinate  
3 the emergency response in the regional area. There is therefore a  
4 need for a communication system and backup PSAP which will permit  
5 management of the emergency situation regardless of the status of  
6 the primary PSAP.

7 The situation that often occurs in connection with emergency  
8 scenarios is that the primary PSAP is overloaded with calls from  
9 citizens regarding the disaster. With the organization of the  
10 phone system comprising a local telephone carrier exchange central  
11 office with numerous branches extending outwards therefrom, it is  
12 most likely that communication between individuals and the local  
13 telephone carrier exchange central office will continue during a  
14 disaster while the connection between the local telephone carrier  
15 exchange central office and the PSAP becomes overloaded, thus  
16 preventing calls from being received at the PSAP. When the phone  
17 system overloads, communication between the PSAP and the local  
18 telephone carrier exchange central office is disrupted and it has  
19 been found that the majority of 911 facilities in the country do  
20 not have adequate backup communication systems to overcome such a  
21 disruption. In fact, it is not commercially feasible in all but  
22 the largest metropolitan areas to include such a backup system and  
23 therefore in the majority of situations, when the connection  
24 between the local telephone carrier exchange central office and the  
25 PSAP fails, no further communications with the citizenry is  
26 possible. There is therefore a need for an emergency  
27 communications backup system which will permit continued  
28

1 communication with the citizenry during times of emergency.

2       The emergency backup communications system of the present  
3 invention would include at its core a main national headquarters  
4 which is located in a facility with comprehensive military-style  
5 protection and security from all forms of disaster and threats  
6 including but not limited to physical, electronic, chemical,  
7 biological, nuclear and radiological events, thus rendering the  
8 main national headquarters generally impervious to all but the most  
9 exceptional disaster. Although such a headquarters may be located  
10 in any appropriate community, it is preferred that the headquarters  
11 be centrally located in the United States in an area of the country  
12 which is not earthquake-prone in order to insure the integrity of  
13 the headquarters. It has been found that the Omaha, Nebraska  
14 metropolitan area offers an exceptionally well-located and well-  
15 prepared metropolitan community for such a headquarters, although  
16 it is to be expected that numerous regional command centers would  
17 be located in metropolitan areas around the country, each of which  
18 would be in guaranteed communications via the redundant  
19 communication systems with the main headquarters to ensure  
20 coordinated response in the event of a disaster regardless of the  
21 location around the country. The main headquarters would utilize  
22 backbone communications trunks, including landline, fiber optic,  
23 microwave, UHF and VHF broadcasting facilities and other radio and  
24 satellite technologies to maintain communication between the main  
25 headquarters and regional headquarters and local exchange carrier  
26 central office facilities. It should be noted that the term  
27 "redundant" as used in this disclosure refers to these multiple  
28

1 backup communication systems, and not in merely a general way to  
2 the currently available 911 systems. This broad array of  
3 communications infrastructure exists (in many ways, uniquely) in  
4 the Omaha, Nebraska metropolitan area. Of course, it is preferred  
5 that the regional command centers each be protected in a facility  
6 similar to that used in connection with the main national  
7 headquarters with comprehensive military-style protection and  
8 security from all forms of disaster and threats including but not  
9 limited to physical, electronic, chemical, biological, nuclear and  
10 radiological events, thus rendering the regional headquarters  
11 generally impervious to all but the most exceptional disaster. One  
12 way to envision the main and regional headquarters system is to  
13 think of it as a "hub and spoke" system, with the main headquarters  
14 in communications connection with each of the regional headquarters  
15 and each of the regional headquarters in communications connection  
16 with the local telephone exchanges and PSAPs, although it should be  
17 noted that some direct connections between the main headquarters  
18 and local telephone exchanges and PSAPs may be desirable to ensure  
19 continuous emergency connections.

20 It is important to note that the emergency backup  
21 communications system of the present invention is intended to  
22 supplement those 911 systems already in existence around the  
23 country but which, for various reasons, cannot be updated or made  
24 redundant. The main headquarters will be staffed and operated  
25 twenty-four hours a day, seven days a week, in order to be  
26 available for any disaster occurrence and in any situation. It is  
27 expected that the call center staff will be highly trained and  
28

1 familiar with the locations to which they are assigned in order to  
2 insure proper and quick response to any incoming call. This  
3 training is especially critical in connection with the present  
4 invention as the emergency backup communications system of the  
5 present invention will likely be used only in the event of severe  
6 emergency where a disaster has crippled the existing 911 system to  
7 such an extent that the emergency backup communications system must  
8 be employed. Therefore, the individuals staffing the main  
9 headquarters and, for that matter, the regional headquarters, must  
10 be highly trained, highly competent, and highly motivated to  
11 decisively enact emergency responses in dire circumstances.

12 At the heart of the present inventions are the redundant  
13 communication systems, facilities, and technologies which connect  
14 the main headquarters and regional headquarters to existing PSAPs  
15 and local telephone carrier exchange central offices, thus  
16 providing seamless connectivity in the event that one or more  
17 primary PSAPs become inoperable or destroyed. The emergency backup  
18 communications system of the present invention includes interfaced  
19 technologies which permit the main headquarters and the regional  
20 headquarters to connect with a variety of local computer-aided  
21 dispatch systems (CAD), as well as various technologies to insure  
22 compatibility with automated location identification systems (ALI),  
23 each of which are currently used by 911 systems in operation at  
24 this time. However, it is important to note that as there is not  
25 a universal CAD or ALI system used by each and every one of the 911  
26 systems currently in operation, an important component of the  
27 present invention is the ability to interface with the different  
28

1 CAD and ALI systems currently being used in the emergency response  
2 field to ensure that communication between the local telephone  
3 exchanges and PSAPs is maintained.

4 Figure 2 illustrates a typical 911 emergency call handling  
5 process. As can be seen, once the citizen places an emergency call  
6 from a residence or business or cellular phone, the call is routed  
7 through local telephone exchange carrier facilities such as an end  
8 office and then into a central office where the call is routed to  
9 the PSAP call center. It should be noted that in the vast majority  
10 of situations, these emergency calls are routed over standard  
11 telephone lines which remain susceptible to disruption due to  
12 disaster. Once the PSAP receives the emergency call, the PSAP  
13 operators determine the appropriate action and initiate the  
14 emergency response by contacting emergency response personnel.  
15 This is typically done through the implemented CAD and ALI systems  
16 which identify the location of the emergency response unit and  
17 dispatch the unit to the emergency call, be it police, fire, or  
18 paramedic emergency dispatch. The question is, what occurs when  
19 communication between the citizen and PSAP is disrupted? The  
20 answer is, absent a redundant backup system as disclosed in the  
21 present invention, nothing. No response to an emergency can be  
22 dispatched as the local 911 operator is unaware of the occurrence  
23 of the emergency.

24 The emergency backup communications system of the present  
25 invention is shown in operation in Figure 3. In this scenario, the  
26 citizen would place the emergency call which is routed through the  
27 local exchange carrier facilities and which is attempted to be  
28

1 routed to the PSAP call center. The PSAP call center, however, is  
2 unable to be contacted due to communications lines being down or  
3 the PSAP center being disabled or destroyed. The call is  
4 automatically rerouted to the emergency backup communications  
5 system of the present invention which would travel either to a  
6 local or regional emergency backup communications system  
7 headquarters, or directly to the main backup system headquarters  
8 via secure and redundant communication systems. Each of the local  
9 exchange carriers connected to the emergency backup communications  
10 system of the present invention would be connected via redundant  
11 communication systems such as landline, fiber optic, microwave, and  
12 other radio and satellite technologies, each of which would  
13 function in turn to ensure the connection between the local  
14 exchange carrier and the emergency backup communications system.  
15 As the emergency call is received at the regional or national  
16 headquarters of the emergency backup communications system, the  
17 emergency operator would screen the call and immediately contact  
18 local emergency response teams available in the area of the citizen  
19 placing the emergency call and dispatch them via the CAD and ALI  
20 systems as previously described. One major difference between the  
21 CAD and ALI systems currently being used with 911 systems and the  
22 CAD and ALI systems proposed for use with the present invention is  
23 that the regional or nationwide nature of the emergency backup  
24 communications system of the present invention permits the dispatch  
25 of emergency units to the emergency call even if such units are not  
26 specifically connected with the primary PSAP which was disconnected  
27 or destroyed. Of course, the appropriate local emergency unit  
28

1 would be dispatched based on availability, but it is an improvement  
2 of the present invention over the 911 systems currently found under  
3 the prior art that emergency response is not restricted to those  
4 units connected with the destroyed primary PSAP. Furthermore, the  
5 national and regional headquarters would have multiple CAD  
6 interfaces which permit communication with all of the emergency  
7 vehicles and teams available for response in the area of the  
8 disaster, be it police, fire or paramedic. The emergency backup  
9 communications system of the present invention would remain on line  
10 until such time as the primary PSAP is restored, at which time  
11 control of the emergency situation would be passed back to the  
12 primary PSAP and the emergency backup communications system of the  
13 present invention would resume its intended backup functionality.

14 An important feature of the present invention is that the  
15 emergency backup communications system is designed for use with  
16 both military and civil communications systems on all levels,  
17 including local, state and federal governmental entities. A major  
18 problem with current 911 systems is that they are not designed to  
19 communicate with other agencies, and thus emergency response  
20 capability is compromised. The critical difference between current  
21 911 facilities and the emergency backup communications system of  
22 the present invention is that the 911 facilities are microsystems,  
23 in that they are only designed and used with specific local  
24 emergency response teams, whereas the present invention is a  
25 macrosystem in that it is designed to coordinate emergency response  
26 not only locally, but regionally and nationally if necessary.  
27 Local 911 may be unaware of the various federal agencies available  
28

1 to them in an emergency, including such agencies as the Center for  
2 Disease Control, the Federal Emergency Management Agency, Homeland  
3 Security and the various branches of the military, including the  
4 National Guard. In fact, the present invention is designed  
5 specifically for use in connection with the recently enacted  
6 Homeland Defense initiatives which are designed to deal with the  
7 results of terrorist attacks, including bioterrorism and other  
8 weapons of mass destruction. Current 911 systems are not designed  
9 to deal with large-scale disasters, and the likelihood that these  
10 systems will overload and fail in such a situation is very high.  
11 The emergency backup communications system of the present invention  
12 is specifically designed to facilitate such interorganizational  
13 cooperation in an emergency situation, and thus presents a  
14 substantial improvement over the current 911 systems in use.

15 It is further expected that the emergency backup  
16 communications system of the present invention will be used for  
17 other applications in which a redundant alternative communication  
18 system capable of operating under extreme conditions is necessary.  
19 Figure 4 illustrates some of the expected and potential services  
20 along with their expected benefits. Several scenarios are  
21 envisioned, including the emergency backup communications system of  
22 the present invention providing outsource 911 services for  
23 communities which, for one reason or another, are unable to design,  
24 build, install, or maintain the necessary emergency response  
25 systems. The economies of scale often dictate that smaller  
26 communities cannot afford stand-alone dedicated PSAP facilities and  
27 it is an intended function of the present invention to provide  
28

1 emergency response facilities for the smaller communities in which  
2 incoming 911 calls would be routed to the regional or national  
3 headquarters of the emergency backup communications system of the  
4 present invention and appropriate emergency responses would be  
5 dispatched by the emergency backup communications system operators  
6 on the local scale to the person or persons making the 911 call.  
7 Alternatively, the emergency backup communications system of the  
8 present invention is usable to provide overflow capability to the  
9 PSAPs of larger communities or communities that maintain PSAPs for  
10 minimal call volumes. The emergency backup communications system  
11 of the present invention would be engaged upon reaching the  
12 overflow threshold and would be available for increased call volume  
13 to ensure that all calls are dealt with speedily and correctly.

14 Another potential use of the present invention is in  
15 connection with non-emergency community service communications  
16 which many communities would provide but are unable to do so due to  
17 the cost of the dedicated information source. Such communications  
18 are often referred to as 311/211 calls, which generally deal with  
19 health and human services calls. These calls are inquiries by  
20 citizens related to use of public assistance related to homeless  
21 and other shelter facilities, availability of medical services, tax  
22 and licensing requirements as well as other such community-related  
23 informational communications. With a modicum of training and  
24 automated system-generated scripts to standardize call response and  
25 increase efficiency, the emergency backup communications system of  
26 the present invention can be adapted to provide such services and  
27 would serve as a call center and information clearing house for the  
28

1 community. The 24/7 nature of the emergency backup communications  
2 system of the present invention would provide far better service  
3 than the currently available 311 and 211 call systems, and would  
4 cost communities far less as the overall cost would be divided  
5 between multiple communities.

6 Another scenario in which the emergency backup communications  
7 system of the present invention will be usable is in connection  
8 with pre-recorded outbound calls of public service nature. This  
9 scenario would be referred to as a "reverse 911 call" and the  
10 emergency backup communications system of the present invention  
11 would be used to initiate recorded outbound calls making  
12 announcements such as, for example, the availability of new or  
13 existing community facilities, e.g. swimming pool seasonal  
14 opening/closing, announce voting location hours/procedures as well  
15 as notification of potential safety threats including pending  
16 storms, toxic spills or virus threats. Again, with only minor  
17 modifications, the emergency backup communications system of the  
18 present invention is usable in such a situation due to the  
19 adaptability and protected communications provided thereby.

20 Finally, the emergency backup communications system of the  
21 present invention is usable as a call center to serve the Human  
22 Resource needs of government agencies. Initially, large  
23 international agencies such as the Department of Defense could  
24 provide HR related services to their employees on a 24/7 basis  
25 accessible from any location in the world. The emergency backup  
26 communications system of the present invention is adaptable to  
27 address questions related to paychecks, benefits and employee  
28

1 assistance programs. The instantaneous response capability of the  
2 emergency backup communications system of the present invention  
3 permits the user to access information regardless of the time and  
4 location of the origination of the call, and thus provides a  
5 significant service improvement over those systems found in the  
6 prior art.

7 Of course, it is to be understood that numerous modifications,  
8 substitutions and additions may be made to the emergency backup  
9 communications system described herein. For example, the exact  
10 implemented features and functional characteristics of the features  
11 described above may be changed or modified so long as the intended  
12 functionality of providing a redundant emergency backup  
13 communications system is maintained. Additionally, the precise  
14 location and characteristics of the headquarters described herein  
15 may be changed or modified so long as the functionality of the  
16 headquarters, be it local, regional or national, is not impaired.  
17 Finally, modification of the communication systems based on  
18 improved technology expected and will not affect the functionality  
19 of the disclosure contained herein.

20 There has thus been shown and described an emergency backup  
21 communications system which fulfills all of its intended purposes.  
22  
23  
24  
25  
26  
27  
28